REPRODUCING THE TRAFFIC SCHEDULE ON ROUTE EIGHTEENTH IN NAMANGAN CITY

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Anatation. This article presents the work on the redevelopment of the timetable for route eighteenth in Namangan, cardinal improvement of the passenger transportation system in urban conditions, raising it to the level of modern requirements, improving transportation conditions, determining the direct and return bus routes in the volume of transportation by the hour, ensuring timely passage of buses, complete organization of work.

Keywords: Route, classification table, city bus, passenger traffic, traffic flow, bus capacity.

ДОРАБОТКА РАСПИСАНИЯ ДВИЖЕНИЯ ПО МАРШРУТУ 18 В ГОРОДЕ НАМАНГАН

Анататсия. В данной стате представлена работа по повторной разработке расписания движения по маршруту восемнадцатый в Намангане, кардиналному совершенствованию системы пассажирских перевозок в городских условиях, поднятию ее до уровня современных требований, улучшению условий перевозок, определению прямого и обратного автобусного маршрута в объеме перевозок по часам, обеспечению своевременный проезд автобусов, полная организатсия работы.

Ключевые слова: Маршрут, классификатсионная таблитса, городской автобус, пассажиропоток, транспортный поток, вместимост автобуса.

NAMANGAN SHAHRIDAGI O‘N SAKKIZINCHI YO‘NALISHDA HARKATLANISH JADVALINI QAYTA ISHLAB CHIQISH

Anatatsiya. Ushbu maqolada Namangan shahridagi o‘n sakkizinchi yo‘nalishda harakatlanish jadvalini qayta ishlab chiqish, yo‘lovchi tashish tizimni shahar sharoitida tubdan takomillashtirish, uni zamon talablari darajasiga ko‘tarish, tashish sharoitlarin yaxshilash, tashish hajmida oldinga va teskari avtobus yo‘nalishi soatlar bo‘yicha aniqlash, avtobuslarni o‘z vaqtida yurishini ta’minlash xamda yo‘lovchilar uchun qulayliklar yaratish ishlarini to‘la tashkil qilish, tashish hajmi sutkaning soatlari bo‘yicha ma’lumotlar keltirilgan.

Kalit so‘zlar: Yo‘nalish, harkatlanish jadvali, shahar avtobus, yo‘lovchi oqimi, transport oqimi, avtobusning sig‘im.

Due to the economic reforms carried out in the country, the industry is characterized by a resumption of growth, a significant increase in the types and volume of services, further strengthening of the production and technical base, further expansion and growth of the network and structure of car service enterprises, a sharp increase in the number of private car companies operating in the form of small and medium-sized businesses, the launch of passenger transportation in our country, the emergence of competition in the industry.

So, the organization of passenger transportation in our region, which was mentioned above, was the same period. There are 6.3 thousand km of highways in the region, and the traffic flow on them is increasing day by day [1].

For example, the length of the highway “Irvadon - Chorsu” (eighteenth bus route) in Namangan city is 13.2 km, and it is considered a road of state importance. Its average traffic flow is 5000-8000 vehicles/day. This is one of the busiest highways in the city. For this purpose, it is necessary and the right decision to redevelop the traffic schedule of the Namangan city Irvadon - Chorsu route. This will create a number of conveniences for drivers of vehicles traveling on this road. This highway also crosses densely populated areas, which will create the opportunity to create additional jobs. [2].

Based on the above, we will consider the following in order to redevelop the traffic schedule on the eighteenth route in Namangan city.

Kunlik yo‘lovchi tashish hajmi:

Q_{AB} = 2,89 thousand passengers;

Q_{BA} = 2,059 thousand passengers;

Route length 1m= 13.2 km;

Number of intermediate stops pop= 11;

Technical speed of the bus Vt= 17.6 km/h;

Average free time at intermediate stops top = 1 min;

Average free time at the initial and final stops tok = 10 min.

Distribution of passenger flow by hours of the day

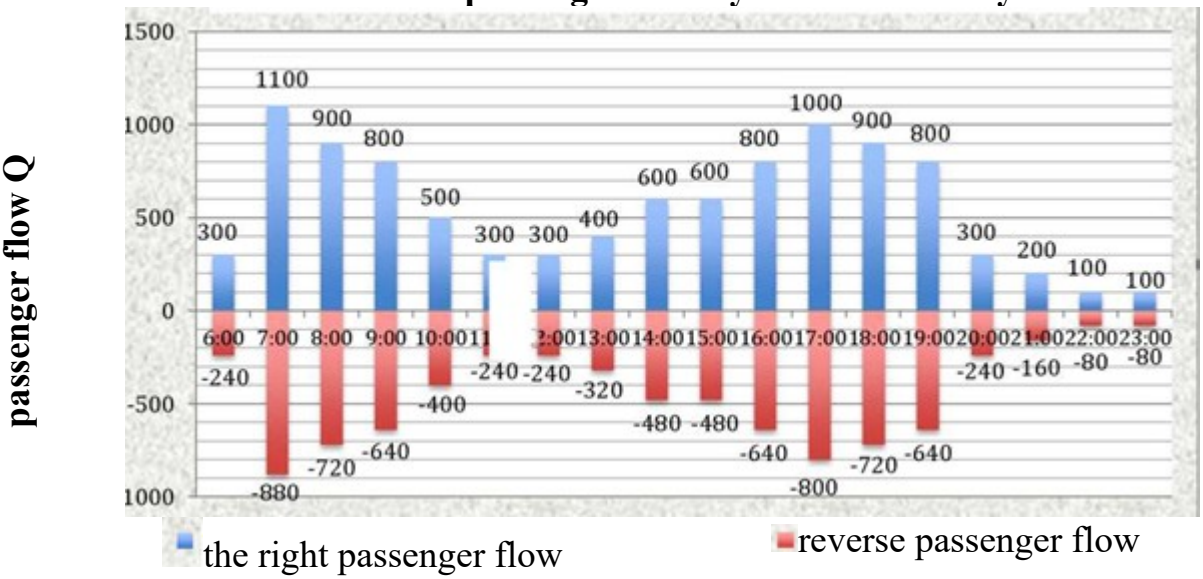

Figure 1. Diagram of the distribution of passenger traffic by hours of the day

The number of buses and the interval between them are determined by the traffic volume during a certain part of the day.

Table 1

Hours of the day	X,% distribution	Passenger		Calculation results			
		Q_{AB}	Q_{BA}	Q_{AB}		Q_{BA}	
				A_m	I_p, min	A_m	I_p, min
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
6-7	3	77	62	5	31,17	4	38,71
7-8	11	281	228	17	8,54	14	10,53
8-9	9	230	186	14	10,43	12	12,90
9-10	8	204	166	13	11,76	10	14,46
10-11	5	128	104	8	18,75	6	23,08
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
11-12	3	77	62	5	31,17	4	38,71
12-13	3	77	62	5	31,17	4	38,71
13-14	4	102	83	6	23,53	5	28,92
14-15	6	153	124	10	15,69	8	19,35
15-16	6	153	124	10	15,69	8	19,35
16-17	8	204	166	13	11,76	10	14,46
17-18	10	255	207	16	9,41	13	11,59
18-19	9	230	186	14	10,43	12	12,90
19-20	8	204	166	13	11,76	10	14,46
20-21	3	77	62	5	31,17	4	38,71
21-22	2	51	41	3	47,06	3	58,54
22-23	1	26	21	2	92,31	1	114,29
23-24	1	26	21	2	92,31	1	114,29
06-24	100	**2553**	**2070**				

Determining the volume of passenger transportation across the city by the hours of the day on the forward and reverse bus route; the volume of passenger transportation along the city bus route by the hours of the day is determined by the formula as follows[3]:

- for forward direction

$AB,\ Q_{AB},\ 6\text{-}7 = X\% \cdot Q_{AB}/100$, passenger; (1)

- for reverse direction

$BA,\ Q6\text{-}7 = X\% \cdot Q_{BA}/100$, passenger; (2)

Calculation and construction of demand diagrams by hours of the day

Return time for travel is determined by t_o

$$to = t_{dv}+(t_{op}+t_{ok}) = (2\cdot l_m/V_t)+2(t_{op}\cdot n_{op}+t_{ok})/60 =$$
$$= (2\cdot 14)/20+2\cdot(0{,}5\cdot 28+5)/60 = 2{,}03 \quad (3)$$

The required number of buses per hour per day is determined by the following formula:

$$A_m = Q_{max}\ to/q_n = (600 \text{ x } 2{,}03)/170 = 12 \text{ bus}; \quad (4)$$

Q_{max} – maximum traffic volume per hour of the day;

q_n – nominal capacity of the bus;

Choosing a bus for a route

Buses of various models and capacities can be used to transport passengers. However, if the nominal capacity does not correspond to the actual passenger density on the route, their use is not the same. The use of small-capacity buses with a large passenger capacity increases the number of vehicles required, increases the load on the streets and the need for drivers. The use of large-capacity buses on routes with low passenger flow leads to significant gaps in bus traffic and excessive waiting time for passengers [4].

The graphical-analytical method consists of the following: Depending on the volume of passenger traffic during the noise period, the estimated value of the bus capacity is selected according to Table 2.

Then, based on Table 3, two types of buses are selected, for which buses with conditional names of larger (q_n) and smaller (q_{cpas}) capacities are compared..

Table 2

Ratio of passenger transport and bus capacity

Passenger transportation, hours	Bus capacity
200-1000	40
1000-1800	65
1800-2600	80
2600-3800	100
3800 i vnshe	160

Table 3

Bus capacity characteristics

Brand and model of the bus	Number of seats, q_{pas}	Total capacity bus q_n, for γ=1
Isuzu NP-37	14	37
Isuzu NC-38	16	40
Isuzu NC-45	20	45
Isuzu SAZ-NP-26	26	26
Isuzu LE-60	32	60

Isuzu SAZ-ND-50	50	50

The bridge is selected with a nominal capacity of the Isuzu NC-40 city bus q_{pas} = 17 people, and q_n = 40 people during peak hours.

The lowest hours are assumed to be when more than 200 people move during peak hours of the day.

Figure 2 . Bus «Isuzu NC-40»

A_m values are included in Table 2.

Based on the A_m values, a diagram of bus needs by hour of the day (Figure 4) was constructed.

Figure 3. Bus demand diagram by hour of the day

The minimum number of buses on the route is determined [4, 5].

$$A_{m\,min} = t_{ob} \cdot 60 / J_{dop}, \quad (5)$$

J_{dop} – maximum interval between buses due to citizen waiting time at the bus stop, J_{dop} =0,20 soat (15min);

$$A_{m\,min} = 2{,}03 \cdot 60/12 = 10{,}09; \quad (6)$$

$A_{m\,min}$ = 6 buses received.

The maximum utilization coefficient of buses on the route is determined by α: equal to 0.9 for all options.

A_{rtax} - *Number of buses on the route:*

$$A_{mtax} = A_{rtax} * \alpha = 14*0,9 = 12 \text{ buses;} \quad (7)$$

α - Bus fleet utilization coefficient, *(KIP);*

The area of the diagram determines the volume of transport work ΣT_m in bus hours:

$$\Sigma Tm = T^1+T^2+\ldots T^n \quad \text{soat;} \quad (8)$$

T^1,T^2- Hours of operation of buses in graph 1-2

General bus shifts along the route are determined:

$$d = (t_{ob} \cdot A_{m\ max}+\Sigma T_m)/D_t \quad \text{bus.;} \quad (9)$$

Dt - Average bus shift duration, $D_t = 8$ hours;

$$d = (2,03 \cdot 18+180)/8 = 27,06$$

Approximately $d = 27$ people.

Determining the shift pattern of bus operations on a route

$$DA_m = (2 \cdot A_{m\ max})/ d = 2 \cdot 20\backslash 27 = 1,48 \approx 2\text{-x shift;} \quad (10)$$

It follows from the calculations that

$$2 \cdot A_{m\ max}\ d = 40 - 27 = 13 \text{ smen.} \sim \quad 12 \text{ shift.;} \quad (11)$$

We assume: 6 buses are single-shift and 12 buses are double-shift.

The correction value for the number of buses per hour of the day is included in Table 4.

Table 4

Number of buses, interval between them by traffic volume during a part of the day.

Hours of the day	Passenger		Calculation results			
	Q_{AB}	Q_{BA}	Q_{AB}		Q_{BA}	
			A_m	I_p, min	A_m	I_p, min
1	*3*	*4*	*5*	*6*	*7*	*8*
6-7	28	54	1	86	2	44
7-8	351	230	16	7	11	10
8-9	231	210	11	10	10	11
9-10	209	181	10	11	8	13
10-11	170	123	8	14	6	20
11-12	126	117	6	19	5	21
12-13	150	94	7	16	4	26
13-14	126	86	6	19	4	28
14-15	131	101	6	18	5	24
15-16	220	119	10	11	5	20
16-17	431	186	20	6	9	13

17-18	410	270	19	6	13	9
18-19	191	175	9	13	8	14
19-20	77	72	4	31	3	33
20-21	29	34	1	83	2	71
Total	**2880**	**2052**				

The travel distance between L_P buses is determined by the following formula::

$$l_p = (t_o/Am)\cdot 60, \text{ min.} \quad (12)$$

Determining the main performance indicators of buses on the route:

The non-uniform coefficient Kt of passenger transportation is determined by the hours of the day

$$K_t = Q_{max}/ Q_{o'rt.max}; \quad (13)$$

Q_{max} – maximum number of passengers transported per hour during peak hours, people; $Q_{ort.max}$ – average number of passengers transported per hour; days, people;

$$Q_{ort} = Q_c/T_r, \text{ kishi;} \quad (14)$$

Q_c – maximum traffic volume during bus traffic on routes; T_r – avtobus soatlari, T_r=17hours;

$Q_{ort}AB$ =10000/17=588 pas;

$Q_{ort}BA$ =8000/17=471 pas;

K_tAB = 1100/588=1,87;

K_tBA = 880/471=1,87.

The coefficient K_n is determined by the unevenness of passenger traffic along the route directions.:

$$K_n = Q_{ortmax}/Q_{ortmin} = (Q_{max}/T_r)/(Q_{min}/T_r) = (10000/17)/(8000/17) = 1,25; \quad (15)$$

The operating speed V., the bus is determined

$$V_e = 2\cdot l_m/t_{ob} = 2\cdot 14/2,03 = 13,79 \text{ km/h}; \quad (16)$$

In conclusion, it can be said that the optimal distance between stops on city bus routes is recommended to be 300–700 meters, depending on the length of the passenger journey. In suburban passenger transport, the distance between stops is 700–1000 meters, and on bus routes to long-distance destinations, taking into account the population centers along the route. The number of stops on the routes

depends on the distances between them and the location of residential areas or the busiest passenger nodes (industrial enterprises, offices, large retail outlets, etc.).

Taking into account traffic safety and in order to increase the throughput characteristics of intersections, stops near intersections should be located at a distance of at least 25–30 meters from them. The location of stops required by bus routes reduces the throughput characteristics of streets and the speed of communication. In order to eliminate this, they should be placed inward, that is, "road pockets".

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